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ABSTRACT

In contrast to traditional types of learning and teaching processes and learning media, such as printed material for Web and hypermedia learning resources, Web resources and Web-based activities are quite often unfortunately more or less separate parts of the planning process and curriculum documentation in an organization's traditional organizational level of educational. This paper introduces a portal system based on curriculum content. An attempt is made to solve the problem of integrating the access and use of learning through both traditional and modern post-modern types of resources into an online interactive coherent system of curriculum documentation at the organizational level. The University of Lapland (Finland) developed an Online Curriculum-based Internet Web portal as a pilot for one course in order to integrate all learning resources through Online Curriculum/Online Syllabus, "eCurriculum/eSyllabus", content into one location. The heart of the system is located on the public Internet and the recent beta testing system is currently based on the HTML standard, thus avoiding the commitment of the organization to a single platform for learning resources. (Contains 13 references and 4 figures.) (Author)

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The Online Interactive Curriculum Portal as One Key to the Well-Structured Learning Activity of Students

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Abstract: In contrast to traditional types of learning and teaching processes and learning medias, such as printed material for Web and hypermedia learning resources, Web resources and Web-based activities are quite often unfortunately more or less separate parts of the planning process and curriculum documentation in an organization's traditional organizational level of educational. This paper introduces a portal system based on curriculum content. An attempt is made to solve the problem of integrating the access and use of learning through both traditional and modern post-modern types of resources into an online interactive coherent system of curriculum documentation at the organizational level. At our university, we have developed an Online Curriculum -based Internet Web portal as a pilot for one course in order to integrate all learning resources through Online Curriculum / Online Syllabus, "*eCurriculum / eSyllabus*", content into one location. The heart of the system is located on the public Internet and the recent beta testing system is currently based on the HTML standard, thus avoiding the commitment of the organization to a single platform for learning resources.

Introduction

Recently, there has been a rapid increase in the use and the will to use and develop different learning types, learning resources, and course contents and even entire course modules that are partly or wholly based on the pedagogical use of computers and computer networks. A very important question to ask is how our curricula and the formats for curriculum representation should be developed in order to support possible new post-modern types of learning and provide easy access for the use of new types of learning resources.

In general, the pedagogical planning process is said to be a process that generates a more or less coherent structural model of resources, systems, and activities for learning and education and the use of different systematic tools in order to achieve the goal.

That the concept of a curriculum and its importance are undoubtedly a central key element in the traditional educational process is quite clear. It can be said that the entire activity of learning is constructed around a curriculum, and the curriculum is the integrating element for the entire educational module or its part - a course or the whole programme. The goals of a curriculum also form the basis for the evaluation and assessment of the outcome of learning. In general, a curriculum can be viewed at the least as the vision of the goals and similarly as the systematic representation of the tools (both mental and material) needed in order to achieve that vision.

The Traditional Ways of Representing Curricula

Often, a curriculum and its different representative formats are also used as the requirements for a course. It may be published in several printed and electronic formats as a book or as an Internet page and given to students or to school or university officials and teachers as a means for the general understanding of the course, its goals, contents, and requirements. It specifies the tasks or achievements during a course, the literature to read in order to pass the course, plus the methods of assessment. The traditional ways of generating and representing curricula, despite the publication platform such as the Internet, can be said to have typically been static. The metaphor has been to *publish* and not to generate an interactive integrated system of tasks and resources for learning by collecting them all into one location as a tool for easy access through a single resource. In this new situation, rather than that of a static presentation of content, the metaphor for a curriculum could perhaps be more as an interactive, integrative, iteratively developed living tool that is applied in order to achieve certain goals (See e.g., Poldolskij 1997.)

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Without a more specific analysis of the ideologies enshrined within a curriculum (*such as e.g., PBL*) and the different view of education they impose, as well as the need for representative formats of a curriculum, it can be argued: In many cases, the present ways of producing a curriculum, curriculum representations, and the implications of Instructional Design based upon it, are quite well suited to traditional, rather static institutionalised and non-virtual types of learning, such as those forms of learning and teaching traditionally organized in schools and universities.

We have quite good tools, both mental (*e.g., well-defined and widely used concepts*) and many material tools, for the traditional type of educational activity. We have, for example, rather satisfying ways finding, distributing, storing, using, and representing traditional written material as books or handouts or other types of traditional media. We have generated systems such as libraries and library databases, publication data systems, or ISBN/ISSN numbering systems to easily handle such data; there are such things as traditional course readers, and ways estimating its reliability and value. (Cp. e.g. Velman 1997.)

The New Role of a Curriculum as an Interactive Online Element to Integrate all Resources

But the challenge is to produce curricula, curriculum representations, and Instructional Design for the modern situation in which an increasing amount of party or wholly location-free teaching and learning activity is present and in which the learning resource types that are used and the structure of learning activity (*the ways in which learning is organized*) are in many ways very different from the traditional format.

It can be said that in the present situation, where there are many new types of learning processes and resources behind all processes, the role and essence of a curriculum as an integrating and clarifying key element in the planning and realization of education is more important than ever before. However, how and by using which kind of tools could this be achieved? Based on that question we started a pilot research project at our university.

How and in which ways should an online tool metaphor curriculum to be generated and represented?

At our university, the University of Lapland, the curriculum for Technology Education for the years 2001 – 2003 has been developed as a pilot project for a new, primarily online curriculum / syllabus, electronic "*eCurriculum / eSyllabus*", that is located behind a Web (*World-Wide Web*) portal in order to integrate different post-modern computerized and networked means and resources together with the more traditional resources for learning into a coherent learning structure <URL:http://www.urova.fi/home/ktk/opettajankoulutus/tekninen_tyo/>. The ultimate aim is to develop an organizational-level application, a hierarchical tree of Web portals through which different courses can take advantage of the generated model.
The portal is primarily used in research projects related to use of different electronic resources and mental tools such as simulations within context of Technology Education (see e.g., Lehtonen 2001), thus providing the integration of those resources and virtual learning activities into a coherent part of student's daily learning activity.
At the beginning, the main question of the process was: What kind of curriculum and its representation would be needed in present post-modern age to integrate different parts of both the traditional and more modern electronic and computerized learning ways, resources, and materials into a meaningful integrative systemic tool for our students? The other main question was how we could integrate as well as possible the traditional ways of curriculum representation with the new ones in order to create as coherent a system as possible for the use for our students. A special interest was also the possibility to link easily the becoming Finnish Virtual University courses <http://www.virtuaaliyliopisto.fi/> as easily as possible to part of our programmes and possibility to offer parts of our programmes through Finnish Virtual University.

The realization of the process involved many phases and was mainly based on Cultural Historical Activity Theory ("CHAT") (e.g., Poldolskij 1998; Kapetelinin & Nardi 1997; Vygottsky 1978). The main questions were to plan and understand the structure of learning activity well enough in order to be able to create the necessary support tools.
The questions were divided into three main areas:

1. The users of the tool: Who is or who are the users?
2. The situation and goals the tool is used: For what purpose does the user use the tool and in which kind of situation?
3. The activity for which the tool is used and the logical structure of the tool: In which kind of (psycho)logical (activity) structure is the use is based on?

Definition of Tool Using Roles

The first task was to define for whom the tools, the tools area, and the portal was created. Through this analysis, we were able to define the student roles for the targeted users of the tool.
The main user roles were found to be:

- the basic course student,
- the optional courses student,
- the specializing course student,
- the student entering training,
- the continuing education student (*assumed to be mainly based on virtual learning activity*).

According to the analysis, these were the most important user roles of system (*the additional roles considered were, for example, resources for field teacher searches s, the person seeking a specialist, etc.*). Through this analysis, the tools and contents were generated to became as targeted as possible in order to fit suitably into the activity structures used by the learner during a specific part of a course. (See Fig. 1 and 2.)

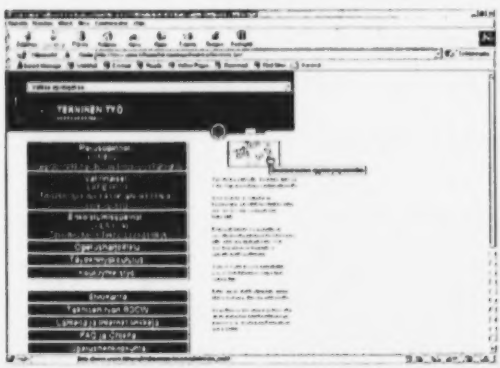

Figure 1 Main page of the beta testing portal, students roles and shortcuts to commonly used resources

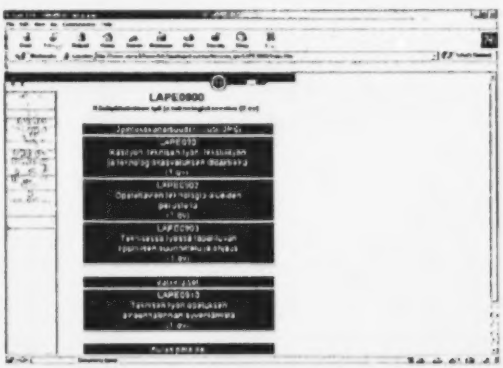

Figure 2 Second level, the course modules and navigation bar

Definition of the Situations and Goals in Which the Tool Is Used

The second question was in which situations students need the portal and the kinds of activities students performed with the tools.
The activity structure of the student analysed was simplified, in that the student wants to get all the necessary resources in order to study a certain course as easily as possible. What does he or she want to find, what does he or she want to do, and how does he or she want to do it?

We can emphasize that obtaining an overall representation for the general plan of achievement and gaining an overall view of what to do, plus obtaining easy access to the tools for the activity, is at least partly formed in the first critical step in a well defined pedagogical process (cp. E.g. Poldolskij 1997). In other words, to be able to say it should be easy to find what to do and where to easily find the needed resources in order to concentrate one's activity as much as possible on the core of the activity itself instead of on some other activity.

The primary answer to this question was that the course portal should be *integrative*. Integrate all the modern electronic and online resources as well as traditionally used resources in order to become as easily accessible as possible. Secondly, the portal should be *iterative*. Include primarily all such data that will be updated during the curriculum and which cannot or is not sensible to represent in printed format in a course catalogue. Such objects would obviously be online linked resources, computer programs, literature, and the more specific course contents that are updated regularly. Thirdly, the portal should be *interactive*. To offer as much as possible sensible interactive solutions to support learners learning activity.

The Logical Structure of the Portal

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The third question was upon which kinds of (psycho)logical structure use could be based? The answer was sought by analysing the present activity of students when they sought for similar data and resources from the more traditional representation of the curriculum and syllabuses. Because our students use a printed course reader, the logical structure of the portal was based as much as possible on the structure of the course reader and the terms and course codes found there. The navigation model is based on the following steps: the student role (*e.g. basic studies*) – a list of basic studies modules – and finally an interactive representation of the curriculum where all the needed resources are linked to the required places.

In addition, an attempt was made to achieve visual similarities between the course reader and the Web portal (see Fig. 3 and 4). The idea was that when one has once learned to use one type of representation or media, one could use that same psychological model in another media format. Because the use of www-material is more based on scanning than continuous reading the text structure contains e.g. clear titles and other helping elements (e.g. Nielsen 2001). Because according the observations the students do print the pages quite often, the format is also optimized for that. E.g. some the link resources contain also the URL section in printable format.

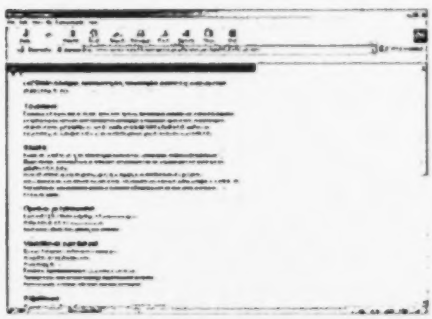

Figure 3 The visual outlook of the portal page

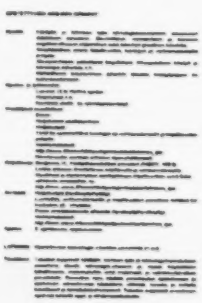

Figure 4 The visual outlook of the course reader

What has been retained as a key point is the attempt to provide a navigation model in which all unnecessary items are done away with in order to reduce the cognitive load of the student as much as possible (e.g. Nielsen 1999; Nielsen 2000a,b; Chandler & Sweller 1991; Sweller & Chandler 1994; Wilson & Cole 1996). However, this is done so that if the student is willing to go directly to a certain offered resources, the aim is to provide as much as possible support for that also by linking some of the most used tools and resources directly from the main portal page and in some cases from a side navigation bars etc.

Online Material Interaction with Traditional Resources

Because of the wide use of more traditional resources of curriculum representation, as course readers or other printed material, the attempt was made to keep the interaction between printed and electronic media as easy as possible. A course reader or any shared paper document (*or e.g. email messages to students*) contains only one link to a course portal page.

The course reader only contains the most critical parts of courses and the more specified contents and linked resources can be found only in the online version. The organization has made a commitment to store the main page address as long as the curriculum is valid. The most important part of the system is the idea of generating the curriculum and its primary representation into an online format and organizing all the resources and materials through the curriculum representation

Why HTML Content on the Internet Instead of a Special "Virtual Learning Tool"?

Why did we choose to put the portal onto the public Internet instead of using a special "*Virtual Learning Tool*"?
The reason for using the public Internet instead of an application was that it provides the possibility to avoid commitment to a single program or environment. It also provides the possibility of generating a one-address portal system through which all resources can be accessed easily and being on the public Internet, there is no need to log in. It has the benefit of integrating very different resources into an easy accessible part of a course. It holds one permanent

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URL address on the organization's server, thus providing easy access from any other organization without the fear changed or moved links, etc. Another benefit is that students only need to know one location in order to access all necessary resources. However, a portal is only a portal. It is only the general structure for integrating elements and tools. If a course needs a Web-authoring tool or a "*Virtual Learning Environment*", they are linked from the outside. The aim is to keep the portal as small as possible. The portal function is the skeleton for the overall structure of studies; the interactive curriculum representation serves the integration of all resources.
All the pages on the portal are linked from faculty's main page under "Course portal pages" and the structure of the portals (*and sub portals*) is the same as in overall structure of the courses in the course reader.

The Present Situation in the Integration of Resources Throughout the Portal

Currently, the portal serves as an integrating element for quite different resources. Dependent of the course module, the portal integrates most of the items listed in the course content:

- More specified course objectives and contents,
- Changes to course literature or articles (e.g. new book or article / required pages of a book or a journal),
- Links to required electronic resources for the course (e.g. Internet links or a link to "*Web collaboration spaces*" such as BSCW® or "*Web learning environment*", many different alternatives are currently in use at our faculty) etc.,
- Registration form for Web learning resources (www-form),
- Readable / printable / downloadable material for the course (includes also e.g. steaming media),
- Links to a additional references for course content (such as external links, virtual galleries, or references),
- Course page feedback form (a html text entry box at the bottom of each page)
- Course feedback form button (standardized www-form in every module),
- Buttons to university library and city libraries,
- 'Search from library' buttons after each book to search and reserve each course book easily from the library (sends the book ISBN-number and starts the library information system opening it in a separate browser window)
- Link to course time tables etc.

The portal page contains also direct links for several most used resources; additional navigation elements e.g. site map and contact information and contact form for faculty personals, etc.

Conclusions

The Web portal based on curriculum representation has now been used for year as a pilot study. Despite its visual simplicity, according the beta tests and more precise usability testing, students have been quite satisfied with it (e.g., see the beta version questionnaire <http://www.urova.fi/home/ktk/opettajankoulutus/tekninen_tyo/koulutuspalaute/>)

The benefits of the system for our student were found to be:

- "*Everything can be found at one location*",
- "*Easy to find needed data up to date*"
- "*Links: E.g. especially library links!*"
- "*Easier to return essays and exams.*" (e.g. Linked BSCW® program) and
- "*The possibility to collaborate through Web tools*"

Some negative aspects of the system have been mentioned:

- "*Not enough computers on the campus, no networked computer at home*",
- "*The linked resources like BSCW are too difficult to use*" and
- "*More pictures*".

The possibility of updating iteratively course contents has also been a great advantage (which makes possible the iterative development of curriculum), otherwise it would have been very difficult to update the course contents or links to several Internet resources and to update or modify course literature easily. Probably the greatest benefit is that despite all modifications to program content, a place where the entire coherent content can be found still exists to students.

Research in the future shall be targeted at developing the students' tools and the overall function in order to support learning activity as much as possible. The plan for the future includes adding some new tools for students, such as search-functions (*requires also better content metadata format*, see e.g. Koper 2001), offering some contents also in

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mobile Internet (*like VML/XHTML*) format for mobile phones and PDA's and making it possible to use e.g. redundant mobile streaming audio format instead of text in some contents. No doubt, the future version will be generated using dynamic html with xml content base or a database rather than static html/JavaScript solution. What has been learned is the fact that online curriculum, *"eCurriculum"*, and this kind of integrative tool have proven its essence from the pedagogical perspective. Future development will be carried out in order to develop and support students learning activity with as many easy accessible integrative, interactive and iteratively updated tools and resources as possible.

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